

STATE OF UTAH  
DIVISION OF OIL, GAS AND MINING

# SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill new wells, deepen existing wells, or to reenter plugged and abandoned wells.  
Use APPLICATION FOR PERMIT TO DRILL OR DEEPEN form for such proposals.

1. Type of Well: OIL ☒ GAS ☐ OTHER:

2. Name of Operator:

Kenneth Pixley

3. Address and Telephone Number:

Rt. 1, Box 132 Altus, OK 73521 (580) 482-4082

4. Location of Well 08N 07W 8; 08N 07W 17

Footages:

CO, Sec., T., R., M.:

5. Lease Designation and Serial Number:

N7570

6. If Indian, Allottee or Tribe Name:

7. Unit Agreement Name:

8. Well Name and Number:

9. API Well Number:

10. Field and Pool, or Wildcat:

Rozel Point

County: Box Elder

State: Utah

## 11. CHECK APPROPRIATE BOXES TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

### NOTICE OF INTENT (Submit in Duplicate)

- |   |   |
|---|---|
| <input type="checkbox"/> Abandon                    | <input type="checkbox"/> New Construction     |
| <input type="checkbox"/> Repair Casing              | <input type="checkbox"/> Pull or Alter Casing |
| <input type="checkbox"/> Change of Plans            | <input type="checkbox"/> Recomplete           |
| <input type="checkbox"/> Convert to Injection       | <input type="checkbox"/> Reperforate          |
| <input type="checkbox"/> Fracture Treat or Acidize  | <input type="checkbox"/> Vent or Flare        |
| <input type="checkbox"/> Multiple Completion        | <input type="checkbox"/> Water Shut-Off       |
| <input checked="" type="checkbox"/> Other See Below |   |

Approximate date work will start \_\_\_\_\_

### SUBSEQUENT REPORT (Submit Original Form Only)

- |  |   |
|--|---|
| <input type="checkbox"/> Abandon                   | <input type="checkbox"/> New Construction     |
| <input type="checkbox"/> Repair Casing             | <input type="checkbox"/> Pull or Alter Casing |
| <input type="checkbox"/> Change of Plans           | <input type="checkbox"/> Reperforate          |
| <input type="checkbox"/> Convert to Injection      | <input type="checkbox"/> Vent or Flare        |
| <input type="checkbox"/> Fracture Treat or Acidize | <input type="checkbox"/> Water Shut-Off       |
| <input type="checkbox"/> Other _____               |   |

Date of work completion \_\_\_\_\_

Report results of Multiple Completions and Recompletions to different reservoirs on WELL COMPLETION OR RECOMPLETION REPORT AND LOG form.

\* Must be accompanied by a cement verification report.

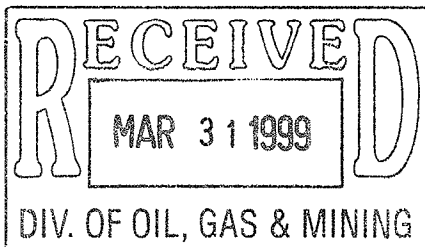
12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)

43-003-15583  
43-003-15584  
43-003-15586  
43-003-20033  
43-003-30024  
43-003-30025

These wells were plugged by E.P.A.

There was no danger to fresh water -- they are covered by approximately 3' of salt water.

We plan to reopen these wells in the near future. The timing is to be determined by the control of water in the Great Salt Lake.



COPY SENT TO OPERATOR  
Date: 5-20-99  
Initials: CHD

13.

Name & Signature:

*Kenneth Pixley*

Title:

*President*

Date:

*3-26-99*

(This space for State use only)

*Per Edie Trimmer C Forestry, Fire, & State Lands; Assignment of Pixley's lease to new operator is pending bonding. They have no bond. Edie to notify us if new leaseholder posts bonds. Otherwise, this may need to go to Board. for plugging order.*

Accepted by the  
Utah Division of  
Oil, Gas and Mining

Date: 5-19-99  
By: *RJK*

(See Instructions on Reverse Side)



# State of Utah

DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL, GAS AND MINING

Norman H. Bangerter  
Governor

Dee C. Hansen  
Executive Director

Dianne R. Nielson, Ph.D.  
Division Director

355 West North Temple  
3 Triad Center, Suite 350  
Salt Lake City, Utah 84180-1203  
801-538-5340

December 6, 1991

To: R. J. Firth  
D. T. Staley  
J. L. Thompson  
S. L. Schneider

From: Lisha Romero

Re: Wells listed under N0000/Unknown Operator on Fee and State leases.

All wells previously listed under N0000/Unknown Operator on Fee and State leases, have been changed back to the last known operator, based on information obtained from the well files. Wells that are currently in Shut-In, OPS, or TA status have been assigned Entity numbers. Bond availability has been reviewed for wells on Fee land. Operator's with unplugged wells will now show up on the monthly turnaround report under the last known operator, except for those wells with TA or OPS status. However, due to the fact that the majority of these operators no longer exist, and the fact that the wells have been in unknown operator status for several years, the operator's addresses have been X'd out to prevent mailing of the monthly report.

My intentions are to follow-up with St. Lands/Ed Bonner on lease cancellations, assignments & bonding for wells drilled on State leases.

The Tax Commission will be notified of these changes, and asked to continue to hold off on any action until DOGM advises otherwise.

I hope this change assists in determining future action regarding the unplugged wells within the state. I have attached information for your review. Please advise me of any additional steps to take.

STATE LEASES

Crest Oil Corp./P0379 (ML-27798) \*Well Stat/TA - No Monthly Report  
Energy Resources Inc./P0799 (ML-26503 & \*ML-35599/Lear Petroleum)  
Grindstaff, E.C./P0384 (ML-27749)  
International Research & Dev. Inc./P0798 (ML-15691 or ML-15651?)  
Losey, Carl/P0390 (ML-39374 & \*ML-3684/JCT, Inc.)  
Main, W.S.L./P0800 (ML-41907)  
Pixley, Kenneth/N7570 (ML-3162 & \*ML-22574 or ML-22574A/Pixley ?)  
Silengo, Charles L./N0900 (ML-27795) \*Well Stat/OPS - No Mo. Report  
United Technical Industries Inc./P0058 (ML-7567/\*ML-39901/F. Adams)  
Utah Oil Company/P0801 (ML-25424)  
Utah Parks Petroleum Co./P0536 (ML-34169)  
Vukasovich Drilling/N1050 (ML-42047)



UTAH  
NATURAL RESOURCES  
Oil, Gas & Mining

355 West North Temple, 3 Triad Center, Suite 350, Salt Lake City, Ut  
84180-1203. (801-538-5340)

Page 1 of 1

## MONTHLY OIL AND GAS PRODUCTION REPORT

Operator name and address:

• PIXLEY, KENNETH  
XXXXXXXXXXXXXXXXXXXXXXXXXXXX  
XXXXXXXXXXXXXXXXXX XX 99999 9999  
ATTN: XXXXXXXXXXXXXXXXXXXXXXXX

Utah Account No. N7570

Report Period (Month/Year) 11 / 91

Amended Report ☐

Well Name			Producing Zone	Days Oper	Production Volume		
API Number	Entity	Location			Oil (BBL)	Gas (MSCF)	Water (BBL)
ROZEL STATE #1			BSLT				
4300315583	00316	08N 07W 8					
ROZEL STATE #2			BSLT				
4300315584	00316	08N 07W 8					
ROZEL STATE #3			BSLT				
4300315585	00316	08N 07W 8					
ROZEL STATE #4			BSLT				
4300315586	00316	08N 07W 8					
ROZEL STATE #5			BSLT				
4300315587	00316	08N 07W 8					
ROZEL STATE #11			BSLT				
4300320029	00316	08N 07W 8					
ROZEL STATE #12			BSLT				
4300320030	00316	08N 07W 8					
ROZEL STATE #15			BSLT				
4300320031	00316	08N 07W 8					
ROZEL POINT ST #16			BSLT				
4300320032	00316	08N 07W 8					
ROZEL STATE #18			BSLT				
4300320033	00316	08N 07W 8					
ROZEL STATE #24			BSLT				
4300320035	00316	08N 07W 8					
TOTAL							

Comments (attach separate sheet if necessary) \_\_\_\_\_

I have reviewed this report and certify the information to be accurate and complete. Date \_\_\_\_\_

Authorized signature \_\_\_\_\_ Telephone \_\_\_\_\_

STATE/ACTIVE & PLUGGED WELLS BY COUNTY

**BOX ELDER**

N7570/Pixley, Kenneth

43-003-15583 - Sec. 8, T. 8N, R. 7W - Rozel State #1 - SOW  
TD 178'/Last Insp. 5-23-84 (ML-3162 & ML-22574 or ML-22574A)  
ML-22574 or ML-22574A/Terminated & Bond Released 1-2-85  
Orig. operator P0009/Charles King to P0007/Union Petrochemical

43-003-15585 - Sec. 8, T. 8N, R. 7W - Rozel State #3 - SOW  
TD 252'/Last Insp. 5-23-84

43-003-20029 - Sec. 8, T. 8N, R. 7W - Rozel State #11 - SOW  
TD 252'/Last Insp. 5-23-84

43-003-20033 - Sec. 8, T. 8N, R. 7W - Rozel State #18 - SOW  
TD 260'/Last Insp. 5-23-84

43-003-20035 - Sec. 8, T. 8N, R. 7W - Rozel State #24 - SOW  
TD 260'/Last Insp. 5-23-84

43-003-20032 - Sec. 8, T. 8N, R. 7W - Rozel Point St #16 - SOW  
TD 256'/Last Insp. 5-23-84

43-003-15584 - Sec. 8, T. 8N, R. 7W - Rozel State #2 - SOW  
TD 251'/Last Insp. 5-23-84

43-003-15587 - Sec. 8, T. 8N, R. 7W - Rozel State #5 - SOW  
TD 251'/Last Insp. 5-23-84

43-003-20030 - Sec. 8, T. 8N, R. 7W - Rozel State #12 - SOW  
TD 226'/Last Insp. 5-23-84

43-003-20031 - Sec. 8, T. 8N, R. 7W - Rozel State #15 - SOW  
TD 260'/Last Insp. 5-23-84

43-003-15586 - Sec. 8, T. 8N, R. 7W - Rozel State #4 - SOW  
TD 251'/Last Insp. 5-23-84

**GRAND**

P0379/Crest Oil Corp.

43-019-30316 - Sec. 2, T. 21S, R. 23E - Crest 2-8 - TA/SGW ?  
TD 1691'/Last Insp. 4-11-90 (ML-27798)  
To N0020/Frank Adams, N1610/Thomas Harrison, N9675/Master Petro. ?



UTAH  
NATURAL RESOURCE  
Oil, Gas & Mining

355 West North Temple, 3 Triad Center, Suite 350, Salt Lake City, Ut  
84180-1203. • (801-538-5340)

DOGM 56-64-21  
an equal opportunity employer

1229-3

Page 1 of 1

## MONTHLY OIL AND GAS PRODUCTION REPORT

Operator name and address:

• PIXLEY, KENNETH  
DRAWER "0"  
ALTUS OK 73521  
ATTN: KENNETH PIXLEY

Utah Account No. N7570

Report Period (Month/Year) 8 / 86

Amended Report ☐

Well Name			Producing Zone	Days Oper	Production Volume		
API Number	Entity	Location			Oil (BBL)	Gas (MSCF)	Water (BBL)
ROZEL STATE #1							
4300315583 00316 08N 07W 8			BSLT				
ROZEL STATE #2							
4300315584 00316 08N 07W 8			BSLT				
ROZEL STATE #3							
4300315585 00316 08N 07W 8			BSLT				
ROZEL STATE #4							
4300315586 00316 08N 07W 8			BSLT				
ROZEL STATE #5							
4300315587 00316 08N 07W 8			BSLT				
ROZEL STATE #11							
4300320029 00316 08N 07W 8			BSLT				
ROZEL STATE #12							
4300320030 00316 08N 07W 8			BSLT				
ROZEL STATE #15							
4300320031 00316 08N 07W 8			BSLT				
ROZEL POINT ST #16							
4300320032 00316 08N 07W 8			BSLT				
ROZEL STATE #18							
4300320033 00316 08N 07W 8			BSLT				
ROZEL STATE #24							
4300320035 00316 08N 07W 8			BSLT				
TOTAL							

Comments (attach separate sheet if necessary)

I have reviewed this report and certify the information to be accurate and complete.

Date

Authorized signature

Telephone

PLEASE COMPLETE FORMS IN BLACK INK

RECEIVED

AUG 04 1986

DIVISION OF OIL  
& GAS & MINING

Kenneth Pixley  
Drawer O  
Altus, Okla. 73522  
July 30, 1986

STATE OF Utah Natural Resources  
Oil, Gas, & Mining  
355 W. North Temple  
3 Triad Center  
Suite 350  
Salt Lake City, Ut. 84180-1203

ATTENTION: R. J. FIRTH

Dear Mr. Firth:

Please refer to your 7/28/86 letter pertaining to the Monthly Oil  
& Gas Production & Disposition Reports.

I know longer have any oil leases; Lease was cancelled 1/2/ 85.

I am not behind in my reports. Have not been behind in my reports.

I have no delinquent reports.

Please look into this matter.

Yours truly,

  
Kenneth Pixley

12-11

*Na-m - can we*

*Arphan see well?*

*Yes! You*  
*12-15-86*



an equal opportunity employ

1/13/86

Page 1 of 1

# MONTHLY OIL AND GAS PRODUCTION REPORT

**Operator name and address:**

~~PIXLEY, KENNETH~~  
DRAWER "O"  
ALTUS OK  
ATTN: KENNETH PIXLEY

# STATE LANDS

Utah Account No. ~~N7570~~ N0003

Report Period (Month/Year) 12 / 85

Amended Report ☐

Well Name	Producing	Days	Production Volume
API Number Entity Location Zone Oper Oil (BBL)			
ROZEL STATE #1 4300315583 00316 08N 07W 8	BSLT		n STATE LANDS TERMINATED
ROZEL STATE #2 4300315584 00316 08N 07W 8	BSLT		" THE LEASE AND RELEASED ED INATED
ROZEL STATE #3 4300315585 00316 08N 07W 8	BSLT		m WITHOUT CLEARING WITH NATED
ROZEL STATE #5 4300315587 00316 08N 07W 8	BSLT		OIL, GAS, & MINING.
ROZEL STATE #11 4300320029 00316 08N 07W 8	BSLT		RESPONSIBILITY FOR ) RELEASE
ROZEL STATE #12 4300320030 00316 08N 07W 8	BSLT		PLUGGING AND REPORTING
ROZEL STATE #15 4300320031 00316 08N 07W 8	BSLT		REVERTS TO STATE LANDS
ROZEL POINT ST #16 4300320032 00316 08N 07W 8	BSLT		Morm 1-13-86
ROZEL STATE #18 4300320033 00316 08N 07W 8	BSLT		7
MC 22594-A			Effective 1-1-85
TOTAL			

Comments (attach separate sheet if necessary)

Chg operators on above wells to State Lands  
of Texas removed.

I have reviewed this report and certify the information to be accurate and complete.

Date \_\_\_\_\_

Authorized signature

Telephone

PLEASE COMPLETE FORMS IN BLACK INK

STATE OF UTAH  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL, GAS, AND MINING

SUBMIT IN TRIPLICATE\*  
(Instructions on reverse side)

9

# SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir.  
Use "APPLICATION FOR PERMIT—" for such proposals.)

1. <input checked="" type="checkbox"/> OIL WELL <input type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER		5. LEASE DESIGNATION AND SERIAL NO. SL 22574-A
2. NAME OF OPERATOR KENNETH PIXLEY		6. IF INDIAN, ALLOTTEE OR TRIBE NAME
3. ADDRESS OF OPERATOR DRAWER "O" ALTUS OK 73521		7. UNIT AGREEMENT NAME
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface		8. FARM OR LEASE NAME Rozel Point
14. PERMIT NO.		9. WELL NO. 1
15. ELEVATIONS (Show whether DF, RT, GR, etc.)		10. FIELD AND POOL, OR WILDCAT
		11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA 8N 7W SEC 8
		12. COUNTY OR PARISH Box Elder
		13. STATE Utah

## 16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

## NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF	<input type="checkbox"/>	PULL OR ALTER CASING	<input type="checkbox"/>
FRACTURE TREAT	<input type="checkbox"/>	MULTIPLE COMPLETE	<input type="checkbox"/>
SHOOT OR ACIDIZE	<input type="checkbox"/>	ABANDON*	<input type="checkbox"/>
REPAIR WELL	<input type="checkbox"/>	CHANGE PLANS	<input type="checkbox"/>
(Other)	<input type="checkbox"/>		<input type="checkbox"/>

## SUBSEQUENT REPORT OF:

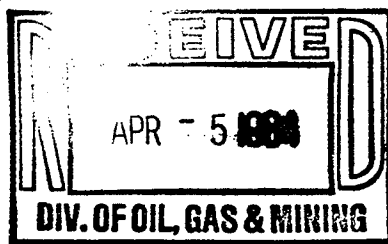
WATER SHUT-OFF	<input type="checkbox"/>	REPAIRING WELL	<input type="checkbox"/>
FRACTURE TREATMENT	<input type="checkbox"/>	ALTERING CASING	<input type="checkbox"/>
SHOOTING OR ACIDIZING	<input type="checkbox"/>	ABANDONMENT*	<input type="checkbox"/>
(Other)	<input checked="" type="checkbox"/>	REPORT OF OPERATOR CHANGE	<input checked="" type="checkbox"/>

(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.) \*

The following wells have been taken over by KENNETH PIXLEY as of December 1, 1983.

API # 43-003-15583	8N 7W SEC. 8	ROZEL STATE#1
API # 43-003-15584		#2
API # 43-003-15585		#3
API # 43-003-15587		#5
API # 43-003-20029		#11
API # 43-003-20030		#12
API # 43-003 20031		#15
API # 43-003-20032		#16
API # 43-003-20033		#18



18. I hereby certify that the foregoing is true and correct

SIGNED

TITLE Pres.

DATE 4-5-84

(This space for Federal or State office use)

APPROVED BY

TITLE

DATE

CONDITIONS OF APPROVAL, IF ANY:

STATE OF UTAH  
DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL, GAS, AND MINING

SUB          N TRIPLICATE\*  
(See instructions on reverse side)

# SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use "APPLICATION FOR PERMIT—" for such proposals.)

1. <input type="checkbox"/> OIL WELL <input type="checkbox"/> GAS WELL <input checked="" type="checkbox"/> OTHER		5. LEASE DESIGNATION AND SERIAL NO. <u>ML 22574-A</u>
2. NAME OF OPERATOR <u>Kenneth Pixley</u>		6. IF INDIAN, ALLOTTEE OR TRIBE NAME <u>        </u>
3. ADDRESS OF OPERATOR <u>300 Pasco De Vida Alhus, OKla 73521</u>		7. UNIT AGREEMENT NAME <u>        </u>
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) <u>At surface</u>		8. FARM OR LEASE NAME <u>Rozel State</u>
14. PERMIT NO. <u>        </u>		9. WELL NO. <u>1</u>
15. ELEVATIONS (Show whether OF, RT, GR, etc.) <u>4203</u>		10. FIELD AND POOL, OR WILDCAT <u>        </u>
16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data		11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA <u>Sec. 8 T8N R7W</u>
17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*		12. COUNTY OR PARISH <u>Box Elder</u>
		13. STATE <u>Utah</u>

## NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF ☐FRACTURE TREAT ☐SHOOT OR ACIDIZE ☐REPAIR WELL ☐(Other) ☐PULL OR ALTER CASING ☐MULTIPLE COMPLETE ☐ABANDON\* ☐CHANGE PLANS ☒

## SUBSEQUENT REPORT OF:

WATER SHUT-OFF ☐FRACTURE TREATMENT ☐SHOOTING OR ACIDIZING ☐(Other) ☐REPAIRING WELL ☐ALTERING CASING ☐ABANDONMENT\* ☐

(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

Changed head & Re worked heating system

RECEIVED  
JAN 12 1982

DIVISION OF  
OIL, GAS & MINING

18. I hereby certify that the foregoing is true and correct

SIGNED Boren Woodbridge

TITLE Secretary

DATE 12-9-81

(This space for Federal or State office use)

APPROVED BY         

TITLE         

DATE         

CONDITIONS OF APPROVAL, IF ANY:

CIRCULATE TO:

DIRECTOR ☐  
PETROLEUM ENGINEER ☐  
MINE COORDINATOR ☐  
ADMINISTRATIVE ASSISTANT ☒  
ALL ☐

RETURN TO Kathy  
FOR FILING

December 23, 1975

MEMO FOR FILNNG

Re: Union Petrochemical of  
Nevada  
State ML-22574  
Sec. 8, T. 8 N., R. 7 W.  
Box Elder County, Utah

An inspection of the operations being conducted in this area was made on December 16, 1975, by Mr. Jim Carter, Mr. P.L. Driscoll, Division of Oil, Gas, and Mining; Mr. Douglas Stewart, Division of the Great Salt Lake, and Mr. Kenneth Pixley, the owner of K.P. Construction Company, the owner of this lease.

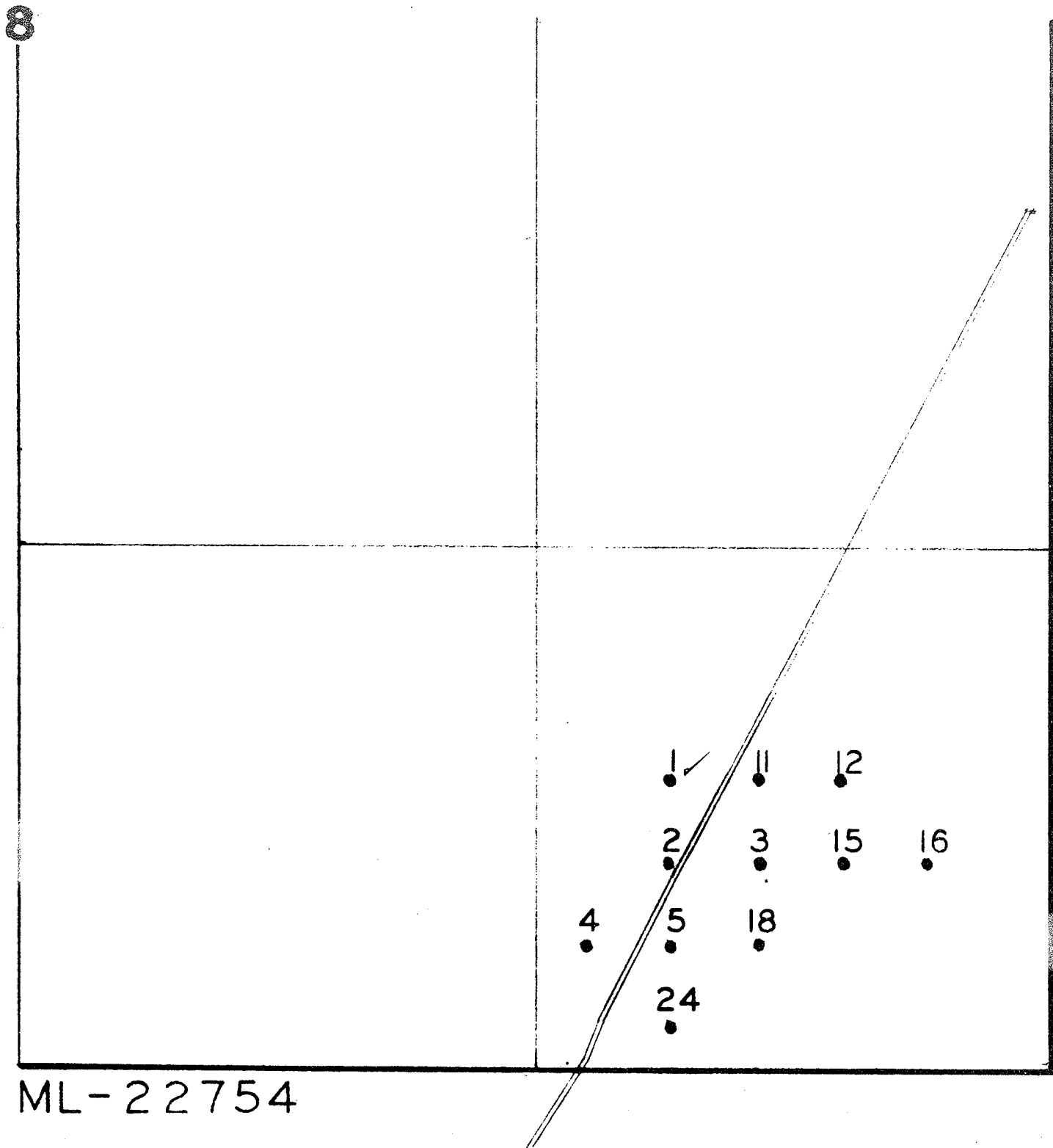
The meeting was quite meaningful and successful in acquainting K.P. Construction Co. with the problems to be encountered in this area; and of K.P. Construction Company's assurance that this situation will be immediately rectified.

PATRICK L. DRISCOLL  
CHIEF PETROLEUM ENGINEER

PLD:tb

cc: U. S. GEOLOGICAL SURVEY

CHARLES E. BIG  
ROZEL FIELD  
BOX ELDER COUNTY, UTAH



✓

1c PMS

NE COR. OF THE  
SE 1/4, SEC 8, T8N, R7W, S.L.M.

LEONORA BULLEN No 1

SOUTH 1914'

West 983'

N

SCALE 1" = 500'

8 | 9  
17 | 16

GULF OIL STATE ROZELL No 1.

### SURVEYOR'S CERTIFICATE

I, Robert G. Pinkerton, hereby certify that I am a Registered Professional Engineer, and that I hold License No. 2519 as prescribed by the laws of the State of Utah, and I have made a survey to the following point:

Being located South 1914 feet and West 983 feet from the N.E. corner of the S.E. 1/4 of Section 8, T8N, R7W, S.L.B. & M.

I further certify that the above plat correctly shows the dimensions of the point located.



Registered Professional Engineer  
License No. 2519

July 16, 1964

Date

May 11, 1965

Re: Oil and Gas drilling bond  
Oil and Gas Lease No. ML22574

Mr. Charles E. King  
Box 535  
Wichita Falls, Texas

Dear Mr. King:

Enclosed please find the drilling bond which you submitted to this office on May 8, 1965. This is being returned to you since it cannot be accepted as a bond covering operations under a State of Utah oil and gas lease. This bond form is one used by the Oil and Gas Conservation Commission for drilling on private lands.

I am enclosing a supply of bond forms acceptable to this office and I have filled one form out in the manner in which it should be filed. I have also included a copy of our rules and regulations for your use. Tule 14 outlines the bond requirements of this office.

You should also note that since you are not the lessee under the lease on which you will be operating it will be necessary for both you and Mr. Reginald to appear as principals on this bond.

Please submit this bond prior to the commencement of operations upon the leased lands.

Very truly yours,

DONALD G. PRINCE  
ECONOMIC GEOGRAPHER

DGP:lr

Encl.

CC: Utah Oil and Gas Conservation Commission  
348 E South Temple  
Salt Lake City, Utah

Mr. Harry Reginald  
4340 Woodman Ave.  
Sherman Oaks, California

June 29, 1967

**MEMO FOR COMMISSIONERS**

**Re: Roxel Point Field  
Charles E. King & Associates  
Box Elder County, Utah**

On June 26, 1967, the above named field was visited.

A check was made to the above named field to observe the progress that the operator was making in developing this reservoir on one-acre spacing in accordance with Cause No. 120-1. The following wells have been completed and have pumping equipment installed: Well No. 1, 2, 3, 4, 5, 11, 15, and 18. Four of these wells were on pump and producing an undetermined amount of oil. All of the storage tanks and steam generators were in operation and overall conditions appeared satisfactory. It should be noted that they had just spudded the No. 24 location and were drilling at a depth of 42'. The Company will be contacted and advised to keep the Commission informed on their drilling progress and production rates.

**PANL W. MURCHELL  
CHIEF PETROLEUM ENGINEER**

**PWB:kh**

**CC: Rodney A. Smith, District Engineer  
U. S. Geological Survey  
8416 Federal Building  
Salt Lake City, Utah**

**One copy filed in latest completed well file.**

9

X

SUBMIT IN DUPLICATE\*

STATE OF UTAH

(See other instructions on reverse side)

OIL &amp; GAS CONSERVATION COMMISSION

## WELL COMPLETION OR RECOMPLETION REPORT AND LOG \*

1a. TYPE OF WELL: OIL WELL ☒ GAS WELL ☐ DRY ☐ Other \_\_\_\_\_

b. TYPE OF COMPLETION:

NEW WELL ☒ WORK OVER ☐ DEEP-EN ☐ PLUG BACK ☐ DIFF. RESVR. ☐ Other \_\_\_\_\_

2. NAME OF OPERATOR

Charles E. King

3. ADDRESS OF OPERATOR

P. O. Box 535, Wichita Falls, Texas

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements)\*

At surface

At top prod. interval reported below

At total depth

14. PERMIT NO.

DATE ISSUED

15. DATE SPUDDED

7/2/64

16. DATE T.D. REACHED

7/12/64

17. DATE COMPL. (Ready to prod.)

7/13/64

18. ELEVATIONS (DF, RKB, RT, GR, ETC.)\*

4202'

19. ELEV. CASINGHEAD

4203'

20. TOTAL DEPTH, MD &amp; TVD

177.5'

21. PLUG, BACK T.D., MD &amp; TVD

22. IF MULTIPLE COMPL., HOW MANY\*

23. INTERVALS DRILLED BY

ROTARY TOOLS

CABLE TOOLS

0-177.5'

24. PRODUCING INTERVAL(S), OF THIS COMPLETION—TOP, BOTTOM, NAME (MD AND TVD)\*

153' - 177.5'

Main Tertiary basalt

25. WAS DIRECTIONAL SURVEY MADE

26. TYPE ELECTRIC AND OTHER LOGS RUN

None

27. WAS WELL CORED

No

28.

CASING RECORD (Report all strings set in well)

CASING SIZE	WEIGHT, LB./FT.	DEPTH SET (MD)	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
13 3/8"	48	153'	17 1/8"	Cemt. w/100 sacks	

29.

LINER RECORD

SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT*	SCREEN (MD)
none				

30.

TUBING RECORD

SIZE	DEPTH SET (MD)	PACKER SET (MD)
none		

31. PERFORATION RECORD (Interval, size and number)

None; open hole

32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.

DEPTH INTERVAL (MD)	AMOUNT AND KIND OF MATERIAL USED
none	none

33.\*

PRODUCTION

DATE FIRST PRODUCTION		PRODUCTION METHOD (Flowing, gas lift, pumping—size and type of pump)					WELL STATUS (Producing or shut-in)	
none							shut-in	
DATE OF TEST	HOURS TESTED	CHOKE SIZE	PROD'N. FOR TEST PERIOD	OIL—BBL.	GAS—MCF.	WATER—BBL.	GAS-OIL RATIO	
			→					
FLOW. TUBING PRESS.	CASING PRESSURE	CALCULATED 24-HOUR RATE	OIL—BBL.	GAS—MCF.	WATER—BBL.	OIL GRAVITY-API (CORR.)		
		→						

34. DISPOSITION OF GAS (Sold, used for fuel, vented, etc.)

TEST WITNESSED BY

35. LIST OF ATTACHMENTS

Geological Sample Description

36. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records

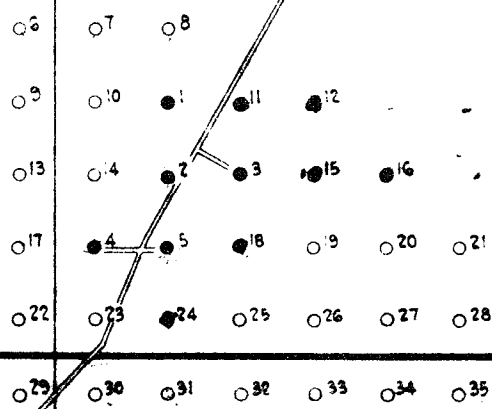
SIGNED


TITLE

DATE

Nov. 1, 1964

\*(See Instructions and Spaces for Additional Data on Reverse Side)



  
CHARLES E. KING

P. O. Box 535

WICHITA FALLS, TEXAS

April 28, 1965

Mr. Cleon B. Feight  
Executive Director  
Oil & Gas Conservation Commission  
348 East South Temple Suite 301  
Salt Lake City, Utah 84111

Dear Mr. Feight:

In regard to your letter of April 27, it seems that there has certainly been some missent information as all of the things you stated were certainly filed with your office. However, it is my understanding that the surveyor's plat was sent by the surveyor for Boyles Brothers Drilling Company.

<sup>487-7595</sup>  
I know when I was in Salt Lake on the 15th of April, I picked up a certified copy of the survey from Mr. Brennan. I will write him now and request that he send another copy to you.

Also, we did get a bond and to my knowledge, it was filed with the proper office. When I was in Salt Lake on the 15th, I gave this bond to Mr. Fredrick S. Prince, Jr., Attorney for-328-4949 him to check on it and what would be needed to drill the other wells that we are going to file for. Please contact him and he will be able to verify this.

As for the Designation of Agent, Mr. Prince can serve in this capacity.

I am sorry for this mixup and certainly hope this will take care of the situation.

Sincerely yours,

  
Charles E. King

CEK/dlc

cc: Donald G. Prince



fe JMB  
April 28, 1965

Mr. J. F. Brennan  
Field Supt., Drilling Division  
Boyles Brothers Drilling Company  
P. O. Box 58  
Salt Lake City 10, Utah

Dear Mr. Brennan:

It seems that the Oil & Gas Conservation Commission never received a surveyor's plat on the well we drilled last July at Point Rozel. I would certainly appreciate your sending a certified copy, such as the one you gave me when I was in Salt Lake, to Mr. Cleon B. Feight, Executive Director, Oil & Gas Conservation Commission, 348 East South Temple, Suite 301, Salt Lake City, Utah.

I had to make a hurried trip to New York, leaving only one day after returning from Salt Lake and I just returned today.

We will have everything ready to go and will be in touch with you the first of next week in regard to starting the four well drilling program.

Again, let me thank you for your many courtesies extended to me when I was in Salt Lake and also for the lunch.

Sincerely yours,

Charles E. King

CEK/dlc

cc: Cleon B. Feight

13

April 27, 1965

Mr. Charles E. King  
P. O. Box 535  
Wichita Falls, Texas

Re: Well No. Rozel State #1  
Sec. 8, T. 8 N., R. 7 W.,  
Box Elder County, Utah

Dear Mr. King:

Reference is made to our letter dated June 26, 1964, in which we granted approval to drill the above mentioned well. However, this approval was conditional upon a surveyor's plat and a Designation of Agent being filed with this office. As of this date we still have not received said information.

We also note that you have not filed a bond covering this well with the State Land Board. Failure to furnish a surveyor's plat, Designation of Agent and a bond could result in your lease being terminated. I would suggest that you take immediate action to rectify the situation.

Very truly yours,

OIL & GAS CONSERVATION COMMISSION

CLEON B. FEIGHT  
EXECUTIVE DIRECTOR

CBF:kgw

cc: Donald G. Prince  
State Land Board  
Salt Lake City, Utah

17

April 1, 1965

Mr. Charles E. King  
P. O. Box 535  
Wichita Falls, Texas

Re: Well No. Rozel State #1  
Sec. 8, T. 8 N., R. 7 W.,  
Box Elder County, Utah

Dear Mr. King:

Thank you for your letter of March 24, 1965.

Consider this letter as formal approval to perform the work as described in your correspondence, on the above mentioned well. Enclosed please find Form OGCC-1b, "Sundry Notices and Reports on Wells," which is to be filed, in duplicate, as soon as the operations are completed.

Thank you for your assistance in this request.

Very truly yours,

OIL & GAS CONSERVATION COMMISSION

PAUL W. BURCHELL  
CHIEF PETROLEUM ENGINEER

PWB:kgw

Enclosed - Forms

14

*DMB*

CHARLES E. KING

P. O. Box 535

WICHITA FALLS, TEXAS

March 24, 1965

Mr. Paul W. Burchell  
Chief Petroleum Engineer  
Oil & Gas Conservation Commission  
310 Newhouse Building  
10 Exchange Place  
Salt Lake City, Utah 84111

Dear Mr. Burchell:

After talking with you yesterday, I contacted a friend of mine in Salt Lake who put me in touch with the firm of Mulliner, Prince and Mangum to represent us in making the application that you advised.

I talked to Mr. Seaton Prince this morning and any help or advice you could give in making this application will certainly be appreciated. I appreciate also, your kind considerations in this and other matters.

You also advised that I should notify you in regard to the work done on the Rozel State #1. Our plan at the present time is to take a small heater on the location which will supply sufficient hot water under pressure to give us bottom hole heat that will be sufficient to raise the temperature of the oil to a point that will be fluid enough to be handled by a regular oil field insert pump. Our plan then is to recomplete the well with regular 2" tubing on which we are putting a sleeved heat exchanger at the bottom, then circulate the hot water through this unit.

We feel we will be successful in being able to produce with this method. As you can see, with this method, we will be able to drill a small hole and complete with normal oil field procedures.

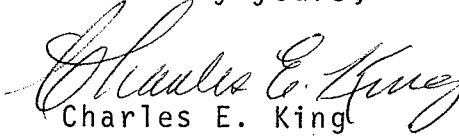
Paul W. Burchell

-2-

March 24, 1965

Please advise if this is all the notice necessary and if any additional information or special forms are to be submitted, please advise.

Sincerely yours,

  
Charles E. King

CEK/dlc

16

January 4, 1965

MEMO TO THE COMMISSIONERS:

Re: CHARLES E. KING  
Rozel State #1  
Sec. 8, T. 8 N., R. 7 W.  
Box Elder County, Utah

On January 2, 1965, I was met at the locked gate by Messrs. Gene Dalton, Farrell Peterson, and Harry Reginald. Mr. Reginald is the actual operator and lease owner. We proceeded to the well site whereupon a test was made to see if the well could produce. Once the chain-driven apparatus started working, it was observed that the viscous crude or "utanol" could be brought to the surface. However, its daily rate of production cannot truly be determined until a continuous 24-hour test can be made. A visit was made to nearby old abandoned well locations and it was apparent that these leases could and have been produced by applying the same principle.

It was definitely established that this well was producing prior to midnight, December 31, 1964, since 5 barrels of this oil could be seen near the well site. Pictures of the operations were made for posterity. Also, I reviewed correspondence from major oil companies which indicated that they had received samples of this oil in the latter part of 1964. Mr. Reginald was advised to report to the Commission both past and future production figures.

Overall operations were considered satisfactory and the unique method by which this crude is being produced can be considered noteworthy.

PAUL W. BURCHELL  
CHIEF PETROLEUM ENGINEER

PWB:pcp

cc: Mr. Max Gardner  
State Land Board  
105 State Capitol Bldg.  
Salt Lake City, Utah

Mr. Harvey L. Coonts, Pet. Engr.  
Box 266  
Moab, Utah

SA  
January 4, 1965

MEMO TO THE COMMISSIONERS:

Re: CHARLES E. KING  
Rozel State #1  
Sec. 8, T. 8 N., R. 7 W.  
Box Elder County, Utah

On the afternoon of December 31, 1964, an attempt was made to check the status of the above named well. Access to the area could not be gained due to the road being blocked with a cable wire. The cable was held in place with a lock that needed a key to open it. A "No Trespassing" sign was nearby which was by the order of Wallace Hunsaker (Honeyville). A picture was taken of the barricade.

Upon reaching Brigham City, I called Mr. Hunsaker; however, no one answered the phone. Since the location is about 42 miles from Brigham City and it was getting dark, the trip was curtailed. Contact will be made with the operators to have the gate opened.

PAUL W. BURCHELL  
CHIEF PETROLEUM ENGINEER

PWB:pcp

cc: Mr. Max Gardner  
State Land Board  
105 State Capitol Bldg.  
Salt Lake City, Utah

Mr. Harvey L. Coonts, Pet. Engr.  
Box 266  
Moab, Utah

19  
H.

XXXXXXXXXXXXXXXXXXXX

XXXXXXXXXXXXXXXXXXXX

XXXXXXXXXXXXXXXXXXXX

November 6, 1964

David H. James  
Consulting Petroleum Engineer  
2119 First National Bank Building  
Denver 2, Colorado

Re: Well No. Rozel State #1  
Sec. 8, T. 8 N., R. 7 W.,  
Box Elder County, Utah

Gentlemen:

We are in receipt of your well log for the above mentioned well. However, upon checking this information, we notice that you did not report the water sands encountered while drilling.

Please complete the enclosed Forms OGCC-8-X, and return to this office as soon as possible.

Very truly yours,

OIL & GAS CONSERVATION COMMISSION

CLARELLA N. PECK  
RECORDS CLERK

cnp

Enclosure

20

CHARLES E. KING

P. O. BOX 535

WICHITA FALLS, TEXAS

November 2, 1964

Utah Oil & Gas Conservation Commission  
348 South Temple, Suite 301  
Salt Lake City, Utah

Re: Well No. Rozel State #1  
Sec. 8, T. 8 S., R. 7 W.,  
Box Elder County, Utah

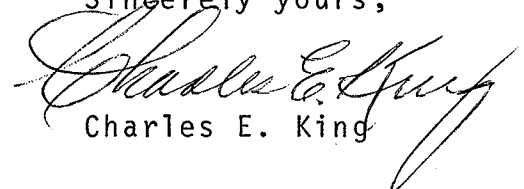
Dear Sir:

I feel ashamed to write this letter, but after looking through my file on the well, I found the original well completion report which I had failed to send in. I have received all the information from my geologist in Denver and for some reason it was misplaced and not sent in.

Enclosed are two copies of the completion report and another report from Mr. Dave James which will give you any other needed information.

As for the monthly report, the well has been shut-in since completion and due to certain production problems, we have not been able to make any test as yet. We are hoping to do so within the next three weeks and the report will be sent to you of the results.

Sincerely yours,

  
Charles E. King

CEK/dlc

Encs. 3

October 28, 1964

Charles E. King  
P. O. Box 535  
Wichita Falls, Texas

Re: Well No. Rozel State #1  
Sec. 8, T. 8 S., R. 7 W.,  
Box Elder County, Utah

Gentlemen:

Our records indicate that you have not filed a Monthly Report of Operations for the months of July, August and September, 1964, for the subject well. Rule C-22(1), General Rules and Regulations and Rules of Practice and Procedure, requires that said reports be filed on or before the sixteenth (16) day of the succeeding month. This report may be filed on Forms OGCC-1b, (U. S. Geological Survey Form 9-331, "Sundry Notices and Reports on Wells"), or on company forms containing substantially the same information. We are enclosing forms for your convenience.

Your immediate attention is required in this matter.

Very truly yours,

OIL & GAS CONSERVATION COMMISSION

KATHY G. WARNER  
RECORDS CLERK

kgw

Enclosure - Forms

23

September 23, 1964

Charles E. King  
P. O. Box 535  
Wichita Falls, Texas

Re: Well No. Rozel State #1  
Sec. 8, T. 8 N., R. 7 W.,  
Box Elder County, Utah

Dear Mr. King:

Our records indicate that you have not filed a Monthly Report of Operations for the months of July, and August, 1964, for the subject well. Rule C-22 (1), General Rules and Regulations and Rules of Practice and Procedure, Utah State Oil and Gas Conservation Commission require that said reports be filed on or before the sixteenth (16) day of the succeeding month. This report may be filed on Form OGCC-1b, (U. S. Geological Survey Form 9-331, "Sundry Notices and Reports on Wells"), or on company forms containing substantially the same information. We are enclosing forms for your convenience.

Your immediate attention is required in this matter.

Very truly yours,

OIL & GAS CONSERVATION COMMISSION

KATHY G. WARNER  
RECORDS CLERK

KGW:ns

Enclosure - Forms

24

August 28, 1964

Charles E. King  
P. O. Box 535  
Wichita Falls, Texas

Re: Well No. Rozel State #1  
Sec. 8, T. 8 N., R. 7 W.,  
Box Elder County, Utah

Dear Mr. King:

Our records indicate that you have not filed a Monthly Report of Operations for the month of July, 1964, for the subject well. Rule C-22(1), General Rules and Regulations and Rules of Practice and Procedure, Utah State Oil and Gas Conservation Commission requires that said reports be filed on or before the sixteenth (16) day of the succeeding month. This report may be filed on Form OGCS-1b, (U. S. Geological Survey Form 9-331, "Sundry Notices and Reports on Wells"), or on company forms containing substantially the same information. We are enclosing forms for your convenience.

Your immediate attention is required in this matter.

Very truly yours,

OIL & GAS CONSERVATION COMMISSION

KATHY G. WARNER  
RECORDS CLERK

KGW:bc

Enclosure - Forms

25

DAVID H. JAMES  
CONSULTING PETROLEUM ENGINEER  
2119 FIRST NATIONAL BANK BUILDING  
DENVER 2, COLORADO

DRILLING AND COMPLETION REPORT

NO. 1 STATE ROZEL

SE/4 SE/4 SECTION 8

TOWNSHIP 8 NORTH, RANGE 7 WEST

BOX ELDER COUNTY

UTAH

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Prepared for

MR. CHARLES E. KING

AUGUST 4, 1964

## DRILLING AND COMPLETION REPORT

No. 1 STATE ROZEL  
SE SE Section 8, T. 8 N., R. 7 W.  
Box Elder County, Utah

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June 30, 1964: Attempted to move in drilling rig. Rig was stuck in mud flats off end of ramp.

July 1, 1964: Rig jacked up and placed on timbers. Constructed timber roadway to wellsite.

July 2, 1964: Rigged up drilling rig. Dug mud pits and spudded well at 3:15 P.M.. Sample of water seeping into mud pits tested 285,000 PPM NaCl. Drilled 7-7/8" hole to 96', pulled bit and shut down. Samples from surface to 96' were soft grey to black muds with occasional white streaks.

July 3, 1964: Drilled soft mud as before to 122' where drilling slowed to 3 to 5 minutes per foot. Shut down and mixed mud at 126'. Pulled bit at 131' and ran hardrock bit, resuming drilling at 12:20 P.M.. Increased viscosity of mud to 45 seconds. Drilling became exceedingly rough at 149' (top of main Basalt). Had shows of asphalt at 124.5', 133'-135', and at 150'. Drilled to 157' and pulled bit and shut down. Circulated samples from 149' to 157' were black to dark green with an abundance of asphalt shows.

July 4, 1964: Increased viscosity of mud to 60 seconds. Ran 17-1/8" hole opener with 7-7/8" pilot bit and opened 7-7/8" hole to 17-1/8" from surface to 124'. Drilling got very rough and twisted three joints of drill pipe trying to drill ahead. Pulled out of the hole at 2:30 P.M. and shut down.

July 5, 1964: Operations suspended while waiting for contractor to have additional drill collars sent to location from Salt Lake city yard.

July 6, 1964: Ran in hole picking up additional drill collars and opened 7-7/8" to 17-1/8" hole from 124' to 153'. Pulled out and shut down.

21. 27

x

July 7, 1964:

Rigged up and ran 5 joints of 13-3/8", 48#/foot, ST&C casing. Cemented casing at 153' with 100 sacks salt saturated 50-50 pozmix with 2% gel. Circulated approximately 25 sacks to the surface. Used top and bottom wooden plugs. Placed Howco centralizers at 151', 120' and 87'.

13-3/8" Casing Detail:

Bottom	1.50'	Howco 13-3/8" guide shoe
Next	158.40'	5 joints 13-3/8", J-55, 48#/ft. ST&C casing
Total	159.90'	
	6.90'	Cut off of landing joint
	153.00'	Casing landing depth

July 8-9, 1964:

Shut in waiting on cement to set.

July 10, 1964:

Ran in hole with 7-7/8" bit, drilled wooden cementing plugs and drilled new hole to 161'. Drilling very rough. Pulled bit and shut down. Samples from 157' to 161' were black to dark green with an abundance of asphalt shows.

July 11, 1964:

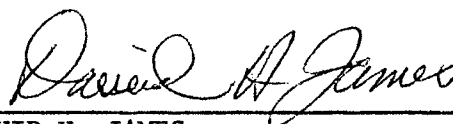
Ran in hole with 12" bit, mixed additional mud and drilled 12" hole from 157' to 172'. Drilling very rough, drilling rate 15 to 20 minutes per foot. Samples were same as previous day.

July 12, 1964:

Finished drilling 12" hole to 177.5'. Circulated hole clean and blew drilling mud out of hole to 80'. Bailed hole dry. Samples were same as previous day. Rigged up and started running bottom hole pump assembly.

July 13, 1964:

Finished running bottom hole pump assembly. Tested same and shut down operations at Noon. Contractor prepared to move off drilling rig.



DAVID H. JAMES  
Consulting Petroleum Engineer

#1 STATE ROZEL  
SE SE 8-8N-7W  
Boxelder County, Utah

Sample Description

- 122-124 $\frac{1}{2}$  basalt w/fair amt jade grn soft mineral (probably chlorite), moderate amt asphalt  
126 $\frac{1}{2}$  basalt w/minor amt grn mineral, minor amt asphalt  
128 $\frac{1}{2}$  basalt w/less grn mineral, tr asphalt  
131 same, w/minor amt ls, dense wh to lt gr sl silc  
  
133 ls, dense wh to lt gr, ptly oolc, tr mineralization such as chalcopyrite, sl silc, occ basalt fragment in ls; 40% basalt  
135 ls, dense wh to gr, ptly oolc, sl silc, abund grains and pebbles of basalt, orange silc calc pebbles and other detritus, almost a conglomerate, abund asphalt  
136 $\frac{1}{2}$  cgl, gr of basalt, orange silc calc and silc ls pebbles w/calc cement, moderate amt asphalt  
139 ls, dense gr silc w/incls os silc ls pebbles and basalt, fairly abund asphalt  
141 same, also basalt  
143 ls, lt gr; basalt 40%; v abund asphalt  
145 same  
147 same w/ls, crm to lt gr  
149 ls, dense, crm silc; basalt 40%; fair amt asphalt  
151 $\frac{1}{2}$  basalt, minor amt asphalt  
153 basalt, occ calcite vein, fair amt asphalt  
157 same w/minor amt asphalt  
159 basalt  
161 same  
162 $\frac{1}{2}$  same  
164 v abund asphalt on basalt and wood fibers (evidently lost circ material)  
167 v abund asphalt on wood fibers  
169 same  
173 same  
177 $\frac{1}{2}$  basalt w/tr olivene and chlorite, minor amt asphalt

29

x

#1 State Rozel continued

Generalized Interpretive Sample Description

122-130 basalt with soft green mineral, probably chlorite, common at top and decreasing toward the base

130-149 conglomerate or conglomeratic limestone, light-colored siliceous limestone with pebbles of basalt, siliceous limestone and other material embedded

149-177 $\frac{1}{2}$  basalt

Discussion

From bottom up the sequence of events was apparently a lava flow followed by shallow water limestone deposition with a considerable amount of basalt and other pebbles deposited along with the limestone. This was followed by another lava flow that may have somewhat mineralized the conglomeratic limestone.

The asphalt must occur at least partly in fractures in the basalt, since asphalt was found before the conglomeratic limestone was drilled. It may also occur in fractures or voids in the conglomeratic limestone. It is also possible that the lower basalt has fractures with asphalt in them. From samples there was no indication of any regular porosity in any of the rock, but voids larger than the samples could still be present.

It is difficult to say whether or not the bottom of the hole was still in asphalt bearing rock. Once the asphalt started coming in the hole it would tend to contaminate any deeper samples.

---

Warren B. Scobey  
Consulting geologist  
14182 West 22nd Avenue  
Golden, Colorado 80401  
August 3, 1964

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X

**Salt Lake City 14, Utah**

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Sec. & 1/4 of 1/4	Twp.	Range	Well No.	Status	Oil Bbls.	Water Bbls.	Gas MCF's	REMARKS (If drilling, Depth; if shut down, Cause; Date & Results of Water Shut-Off Test; Contents of Gas; and Gas-Oil Ratio Test)
			1	SI	0			<p>The #1 well has been shut in while the #1's 2,3,4,5 were being drilled. These 11 wells are now being completed.</p> <p>We have been delayed because of a wait for electric motors of proper speed. Actual production should be about the first of August.</p>
			2	SI	0			
			3	SI	0			
			4	SI	0			
			5	SI	0			

H. J. Reginald  
4340 Woodman Ave.  
Sherman Oaks, California

# UNITED STATES PATENT OFFICE

2,404,871

## LUBRICATING COMPOSITIONS

Paul R. Van Ess, Berkeley, Forrest J. Watson, Oakland, and Gary M. Whitney, Piedmont, Calif., assignors to Shell Development Company, San Francisco, Calif., a corporation of Delaware

No Drawing. Application July 28, 1943,  
Serial No. 496,678

12 Claims. (Cl. 196—13)

1

This invention relates to sulfur-containing additives used to produce improved lubricants and stabilized organic compositions, to methods of preparing concentrates of naturally-occurring sulfur-containing additives for lubricating oils and greases, and to improved methods of inhibiting oxidative decomposition and lubricating internal combustion engines, particularly those containing corrosion-sensitive alloy bearings.

It was quite generally believed heretofore that relatively high boiling sulfur compounds naturally occurring in petroleum crudes were good inhibitors for lubricating oils, imparting to them anti-corrosive properties and oxidation stability. As a result, several high sulfur-content lubricating oils have appeared on the market for which certain superiorities are claimed. However, in many cases such claims cannot be verified by laboratory and engine tests. Moreover, it was found that as a rule these high sulfur lubricating oils have a very strong and dangerous tendency to form lacquer, sludge and carbon on pistons and piston rings, particularly in high temperature operation.

It has now been discovered however that among the naturally-occurring sulfur compounds in petroleum oils there are beneficially active as well as inactive and even detrimental varieties and that the beneficially active compounds can be extracted from the oils in which they occur to produce concentrates of relatively high non-corrosive sulfur content, which, when added to well refined lubricating oils, impart to them good oxidation stability and anti-corrosive properties without materially increasing their tendency to form lacquer, sludge and carbon.

It is accordingly an object of this invention to produce from crude petroleum, sulfur concentrates which, when added to refined lubricating oils and the like, act as oxidation and corrosion inhibitors without materially increasing the lacquering and sludge depositing tendency of the base oil. A further purpose is to provide lubricating compositions having decreased tendencies to attack modern alloy bearings. Another object

2

is to obtain superior aviation and Diesel engine, heavy duty lubricating oils. A still further purpose is to produce novel sulfur-containing petroleum fractions which contribute valuable anti-corrosive, anti-oxidant, anti-wear, high film strength and/or other advantageous properties to organic compositions in which they are incorporated. Other objects will be apparent from the following description.

It has been determined that the anti-corrosive and anti-oxidant properties of the desirable natural petroleum sulfur compounds are associated with the availability or activity of the sulfur in them. If the compounds or mixtures thereof, such as those obtained from petroleum by the hereinafter described methods have low sulfur availabilities, they are themselves substantially non-corrosive to bearing surfaces but may fail to inhibit other types of corrosion. If, however, their sulfur availability is above a certain minimum, they will inhibit against both bearing corrosion and oxidative decomposition and may also contribute other valuable properties to the lubricating oil to which they are added. Some of these additives may produce a brown or colored film on metal bearing surfaces in engine operation. With others, (notably the hereafter described Utanol raffinates) this discoloration of copper surfaces may be substantially absent, but the anti-corrosive and anti-catalytic properties which the sulfur compounds contribute to the lubricating oil are still prominent. Some of these sulfur compositions (e. g. the Utanol raffinates) also possess material anti-wear properties and/or the ability to enhance or prolong the anti-wear properties of other anti-wear agents.

The reactivity or availability of the sulfur in various compounds is defined as the percent sulfur (calculated on the total sulfur content in the compound or mixture) which will react with metallic copper under certain conditions. It is determined by heating at various temperatures samples of the compositions with an excess (over the amount equivalent to the sulfur content) of finely divided metallic copper for a standard pe-

3

riod of time, here taken at 16 hours. The copper sulfide formed is then determined quantitatively as by oxidizing the sulfide with bromine and precipitating the resultant sulfate with barium chloride. If the percent of sulfur reacted is plotted against the reaction temperatures for various sulfur compounds or high sulfur content oils, a family of curves is obtained which at relatively low temperatures are quite close together. However, at temperatures of say 300° C. the curves separate widely and the availability of the sulfur as determined at this temperature gives a reasonable correlation for various petroleum derived sulfur compounds with their inhibiting efficacy when incorporated in refined lubricating oils. At this particular temperature, compounds having sulfur availabilities below about 15% (for example those in West Texas high-sulfur lubricating oil extracts) are of little if any effect, while certain other natural petroleum sulfur compounds of higher availability, i. e. above about 15% and preferably above about 20% (for example, those in Utanol raffinates) are highly effective.

The availability of these sulfur compounds has been correlated with their anti-corrosiveness in lubricating oils, for example by determining the comparative weight losses of copper-lead bearings subjected to the action of lubricating oils containing standard amounts of these sulfur additives plus a commonly used detergent, which, although contributing other valuable properties, causes or increases corrosiveness of the lubricating oil. Thus various blended oils have been tested and compared by a procedure known as the Thrust Bearing Corrosion test, which was described in the National Petroleum News, September 17, 1941, pp. R 294-296.

Fractions or concentrates of active sulfur compounds may be obtained by various methods from various high sulfur petroleum crudes which contain them. In most crudes, the concentration of these compounds is quite low, and special methods (which are described later) are required in order to recover them in relatively high concentration, so that they may be added to refined lubricating oils in effective amounts without materially changing the desirable properties of the latter. As a rule, it is poor practice to add to a well refined lubricating oil more than about 10% of any addition agent. The effective amounts of sulfur which must be added to various refined lubricating oils in the form of active sulfur compounds usually are on the order of 0.1% to 0.3% by weight of refined oil, although quantities of between 0.02% and 1% may be useful. In a semi-plastic composition such as a grease, higher amounts may be employed. Therefore, it is desirable, if not essential, that the sulfur content of a concentrate of active compounds be at least 2% and preferably 5% or higher.

As previously indicated, the indiscriminate addition of natural petroleum sulfur compounds tends to cause an increase in lacquering and sludge depositing tendencies of the blended oils. This however can be minimized by properly refining either the oil from which the active high sulfur concentrates are produced or the concentrates themselves before they are added to lubricating oils. Such refinement includes substantial elimination of asphaltic materials and a treatment capable of separating aromatic from non-aromatic hydrocarbons, for example, by precipitation with gas, such as methane under high pressure as described by Pilat in U. S. Patent

2,315,131, sulfuric acid treatment, solvent extraction, selective hydrogenation, etc., or a combination of such treatments, preferably under conditions not to reduce the sulfur content of the concentrate excessively, i. e. so that not more than about  $\frac{1}{3}$  of the total sulfur content is lost. In other words, our concentrates are "raffinates," "raffinates" as commonly understood in the petroleum industry being relatively paraffinic petroleum fractions from which naturally associated aromatics have been removed. Whether the sludging tendency is the result of over-activity of certain sulfur compounds (as might well be) or is due to the presence of other associated compounds, is not known at this time. However, this is immaterial, as it is sufficient that a treatment adapted to remove aromatics from hydrocarbon mixtures will achieve the desired result.

In general, crudes which contain the active sulfur compounds in concentration sufficient to recover them in relatively concentrated form, are of highly asphaltic nature such as certain California (particularly Mount Poso, Coalinga, Santa Maria) and Venezuelan crudes.

Outstanding is an oil known to the trade as "Utanol" which is an asphaltic petroleum crude obtained from snallow wells in the Great Salt Lake area and southern Idaho. The oily fraction separated from this material is known as "Utah oil." Utanol varies in sulfur content from about 10% to 15%, has a specific gravity of about 1.0 to 1.1, a saponification number of around 10 to 20, naphtha insolubles of 10% to 15%, and contains about 40% to 70% asphalt as determined by precipitation with about 6 volumes of n-butane at 60° to 100° C. It has no appreciable content of phenols.

Methods for obtaining an oil fraction having the desired concentration of active sulfur compounds from crudes having a sulfur content above 5%, such as Utanol, are relatively simple. One such method specifically applied to Utanol is as follows:

The crude is first de-asphalted by any of the standard de-asphalting methods. This may be achieved by asphalt precipitation or distillation, or both. The precipitation method is preferred because of the extremely high asphalt content of the Utanol which may interfere with the proper distillation and result in cracking of the asphalt and the inclusion of harmful cracked material in the distillate.

The precipitation may be carried out by mixing the Utanol with several volumes of a liquid light hydrocarbon oil comprising predominantly or consisting of C<sub>3</sub> to C<sub>6</sub> hydrocarbons, preferably at a temperature within about 75° to 100° C. of the critical temperature of the latter. Thus propane or propylenes at normal room temperature, butanes or butylenes at temperatures of 60° C. or above are well suited. Dissolving in benzene and precipitating with isopentane also proved successful. If desired, the crude may be dissolved in a liquid C<sub>4</sub> to C<sub>12</sub> hydrocarbon, naphtha, light kerosene, etc., and gaseous methane, ethane, natural gas, propane, fuel gas, water gas, CO, CO<sub>2</sub> or other gases may be introduced at high pressures to effect or complete the asphalt precipitation. Moreover, selective so-called "naphthenic" solvents may be present, such as liquid SO<sub>2</sub>, furfural, nitrobenzene, beta,beta'-dichlor-diethyl ether, nitrobenzene, beta,beta'-dichlor-diethyl ether, phenol, cresylic acids, aniline, methylsulfolane, dimethylsulfolane, or a large number of others or their mixtures.

If the crude oil contains relatively low boiling components, as gasoline, kerosene, etc., they may be flashed from the crude prior to the precipitation or else may be separated later by fractional distillation of the deasphalted raffinate oil.

The supernatant liquid layer, i. e. the raffinate phase resulting from asphalt precipitation and containing the desired oil, is now separated from the precipitated asphalt. This oil must be further refined to reduce its lacquer-imparting tendencies.

Depending on the conditions of the precipitation, the nature of the solvents employed and the nature of the crude itself, one of several ways may be followed. Obviously the more drastic the precipitation conditions are, the less drastic need be the second treating step which involves (as previously indicated) a treatment adapted to remove aromatic hydrocarbons. Solvent extraction may be employed with any one of the well known selective "naphthenic" solvents previously mentioned. Treatment with strong, i. e. 93 to 100% sulfuric acid is usually desirable and effective. Amounts of sulfuric acid ranging anywhere from 5 to 100 pounds per barrel of the raffinate oil may be employed.

Several treatments may be combined and the second refining treatment may be carried out in the presence or absence of the light hydrocarbon liquid employed in the precipitation; generally its presence may be helpful in the second step. The undesirable components, if any (which may be in the form of sludge, extract, etc.), produced in the second refining treatment, are now separated. Solvent, if present, is removed in the usual manner as by distillation or washing with water or wash solvent, and the recovered high sulfur oil may be given a finishing treatment with clay (such as fuller's earth, acid activated clay, etc.), bauxite, zeolite, silica gel or other adsorbents.

The specific dispersion of the treated high sulfur raffinate oil is often a fair indication of its lacquer imparting tendencies. It is desirable that the specific dispersion be below about 160, more preferably below about 140 or 145. Also, the color may be an indication if taken together with the specific dispersion. Preferably, the color should be better than 6 (A. S. T. M. or National Petroleum Association Scale).

Samples of treated Utanol raffinate oils from

	Varnish rating	Sludge rating	Bearing wt. loss, mg./cm. <sup>2</sup>	Used oil properties	
				Sap. No. mg. KOH/g.	Neut. No. mg. KOH/g.
Base oil.....	105	73	84.0	22.2	3.6
Base oil + Utanol raffinate ΔS=0.10%.....	106.5	70.5	33.4	25.1	4.6
Base oil + Utanol raffinate ΔS=0.10%.....	109.5	72	21.7	26.8	4.2
Base oil + Utanol raffinate ΔS=0.30%.....	104.5	73	3.2	9.98	2.8

different batches had the following properties:

	General range	One acid treated Pilot raffinate
Gravity, <sup>20</sup> .....	0.98-1.0	0.9880
Viscosity at 100° F.....cs.	950-1400	1,018
Viscosity at 210° F.....cs.	34-39	34.7
Viscosity index.....	40-55	63
Specific dispersion.....	130-145	132
Color.....	4-7.5	4½
Saponification number, mg. KOH/g.....	0-8	0.9
Ultimate analysis:	<i>A clay treated Pilot raffinate</i>	
Carbon.....per cent weight.....	76.27	
Hydrogen.....do.....	10.90	
Sulfur.....do.....	12.7	11.9
Nitrogen.....do.....	0.14	0.06

Ability of Utanol raffinate to decrease wear was determined on a Multiple Four Ball machine similar in principle to the Boerlage apparatus described in the magazine Engineering, volume 136, July 14, 1933. This apparatus comprises four steel balls arranged in pyramid formation. The top ball is rotated by a spindle against the three bottom balls which are clamped in a stationary ball holder. All balls are immersed in the oil to be tested. The tests are run for two hours at 700 R. P. M. under a 7 kg. load and at a controlled temperature of 130° C. Diameters of the wear scars worn on the three balls forming the base of the pyramid are then measured, and the average taken as the true indication of wear. Results were as follows:

	Lubricant	Scar diameter in millimeters
1	Refined aviation lubricating oil, API gravity about 26, SU at 210° F. about 115-125.....	0.7
2	Oil #1 containing clay treated <u>Utanol Pilot</u> raffinate, ΔS=0.10%.....	0.47
3	Oil #1 containing clay treated <u>Utanol Pilot</u> raffinate, ΔS=0.30%.....	0.36

Oxidation tests were made with the same oil to determine the time required for the absorption of 1800 cc. of oxygen by 100 g. of oil in the presence of 1 cm.<sup>2</sup> of copper surface/gram of oil at 150° C. The following data are typical:

	Hours
Oil No. 1 (as above).....	9.3
Oil No. 2 (as above).....	48

This Utanol raffinate was also tested in the Thrust Bearing Corrosion test, referred to earlier, employing a compounded heavy duty truck and bus or Diesel lubricating oil. It contained in each case 1% of the magnesium salt of lauryl salicylate which has been a widely used lubricating oil detergent, but which, although otherwise beneficial, imparts corrosive properties to the lubricant. In 20 hour tests at 125 lbs. thrust and 2400 R. P. M. with this oil, the copper-lead bearings showed a weight loss at 130° C. of 15 mg./cm.<sup>2</sup>. When tested with this same oil, to which had been added a clay treated Utanol Pilot raffinate, ΔS=0.10%, the bearings showed no weight loss at 160° C.

Chevrolet engine tests using procedure L-4-243 of the Cooperative Lubricants Test Program were also made using a corrosive S. A. E. reference oil. Results were as follows:

	Varnish rating	Sludge rating	Bearing wt. loss, mg./cm. <sup>2</sup>	Used oil properties	
				Sap. No. mg. KOH/g.	Neut. No. mg. KOH/g.
Base oil.....	105	73	84.0	22.2	3.6
Base oil + Utanol raffinate ΔS=0.10%.....	106.5	70.5	33.4	25.1	4.6
Base oil + Utanol raffinate ΔS=0.10%.....	109.5	72	21.7	26.8	4.2
Base oil + Utanol raffinate ΔS=0.30%.....	104.5	73	3.2	9.98	2.8

The action of a Utanol raffinate in increasing the efficiency of an anti-wear agent, the calcium salt of methylene bis p-isooctylphenol, may be seen from the following data of piston ring weight loss in a CFR-Diesel engine. Test conditions: 1400 R. P. M.; load, 68 lbs./in.<sup>2</sup> brake mean effective pressure; jacket temp. 100° C.; oil temperature 70° C.; compression ratio 16:1; 47 cetane number commercial Diesel fuel; base oil, commercial Diesel lubricating oil S. A. E. 30; test length, 4 runs of 13 hours, results reported for overall period.

Additive	Piston ring weight loss, mg.
None	73.4
Ca salt of methylene bis p-isooctylphenol 0.10% ash	31.6
Ca salt of methylene bis p-isooctylphenol 0.10% ash plus Utanol raffinate AS=0.10%	29.6

The Utanol raffinates also possess other desirable characteristics when incorporated in a lubricating oil, such as anti-scuffing and anti-scratching properties in Diesel engines. Their beneficial activity may also be enhanced by utilization in the presence of small amounts of synthetic organic sulfur-containing anti-oxidants, e. g. dibenzyl sulfide or disulfide, wax disulfide, diphenyl sulfide, sulfurized sperm oil, sulfurized olefin polymers, sulfurized wax olefins (obtained in the cracking, or by chlorination and dehydrochlori-

relatively high specific dispersion or content of aromatics, the former often being considerably above 160, unless the solvent extraction and additional treatment preparatory to the solvent extraction was very drastic. If the specific dispersion of the sulfur concentrate is above about 145, the concentrate may again be solvent-extracted or sulfuric acid treated, etc., to further reduce its aromaticity and specific dispersion to below about 140 in order to produce an addition agent for lubricating oils which has the least lacquer imparting tendencies.

In the table below, a comparison is made of the effect of the several sulfur concentrates on the oxidation stability (Dornite type oxygen absorption apparatus at 150° C.) in the presence of 1 square centimeter of copper per gram of oil of an S. A. E. 60 lubricating oil when added thereto in amounts to raise the sulfur content by 0.1%:

Source of petroleum material	Method of obtaining sulfur conc.	Spec. dispersion of sulfur concentrate $\frac{n_1 - n_2}{d} \times 10^4$	Time to absorb 1800 ml. of O <sub>2</sub> /100 g. oil
			Hours
Utanol	None added		9.2
Mt. Poso lubricating distillate, furfural raffinate, 55 V. I.	Asphalt precipitation-acid treating	132	47.7
Mt. Poso lubricating distillate, acid treated furfural raffinate, 60 V. I.	Mercuric acetate in acetic acid	126	32.0
Mt. Poso lubricating distillate, furfural raffinate, 55 V. I.	SbCl <sub>3</sub> -AlCl <sub>3</sub>	143	32.1
West Texas distillate	Aluminum chloride	158	21.3
Do	Acid treat+extraction with HgAc <sub>2</sub> in HAc	196	13
	Duosol extraction followed by acid treat	200+	9.8

nation, of paraffin wax), bis-(methylene aryl or alkaryl sulfides), etc.

As indicated before, when starting with crudes or fractions thereof having sulfur contents materially below about 5%, such as California and Venezuelan oils, different methods for recovering the active sulfur compounds must be employed than that described for Utanol. Since oils having a relatively low sulfur content may display a ratio of aromatics to sulfur that is higher, for example, than with Utanols, it is necessary to first remove from these oils some of the aromatics, as by selective solvent extraction with a "naphthenic" solvent of the type described earlier, and if necessary augment this treatment with others such as sulfuric acid treatment. Likewise, crudes relatively low in asphalt and aromatic content do not show the desired concentration of the sulfur compounds by the removal of their smaller amounts of undesirable constituents. The sulfur components, however, can be concentrated by methods such as the following:

Extraction with acetic acid containing a soluble mercury salt such as mercuric acetate, mercuric chloride, etc. to form a mercury complex extract which is then worked up to recover the extract oil and if necessary further refine the latter.

Extraction with a liquid mixture of SbCl<sub>3</sub> and AlCl<sub>3</sub> to form a complex which may be separated and decomposed to recover the oil.

Extraction with AlCl<sub>3</sub> at temperatures between about 0 to 80° C. as described in U. S. Patent 2,309,337 to form a complex which may be decomposed to recover the oil.

All three of these extraction methods yield relatively dark oils, even though the starting raffinate may have been of light color. Moreover, the SbCl<sub>3</sub>-AlCl<sub>3</sub> extraction, as well as the AlCl<sub>3</sub> extraction, tend to cause accumulation in the sulfur concentrate of whatever aromatics have been left over from the preceding solvent extraction, and therefore result in sulfur concentrates of

The method of concentrating sulfur compounds with the aid of mercuric acetate in acetic acid is described below in greater detail:

A sample of 50 V. I. Mt. Poso furfural raffinate was first extracted with glacial acetic acid to remove nitrogen bases. Glacial acetic acid saturated with mercuric acetate was then added to the oil, with stirring, in the amounts shown in the table below. The mixture was allowed to settle and the lower layer drawn off. This extraction may be performed several times on a sample (as shown in the table) and the remaining oil then washed with acetic acid to remove the remaining mercury compounds. It is also advantageous to carry out the extraction in the presence of an inert, oxygen-excluding agent such as nitrogen or natural gas which may be bubbled through the liquid to minimize oxidation. The extracts and acetic acid end-wash are then combined. The acetic acid may be distilled off and the mercury then released from the oil, for example, by heating say to 100° C. with dilute acid (e. g. 2 vols. of 15% HCl) or by saturating with H<sub>2</sub>S, the oil then being diluted with isopentane or other suitable solvent, water-washed, dried and clay-treated before removal of solvent.

The variables for several such runs are shown in the following table:

	Run number		
	I	II	III
Weight of oil used, gms.	620	901	728
No. of dumps of reagents	3	3	3
Volume of acetic acid, mls.	190	215	150
Volume of HgAc <sub>2</sub> plus acetic acid, mls.	485	660	540
Temperature of treatment, ° C.	30	18	50
Total treating time, minutes	90	135	165
Weight per cent yield of extract (on oil)	4.3	4.3	5.4
Per cent sulfur remaining in oil	0.15	0.14 (7)	0.16 (4)
Per cent sulfur in extract oil (average)	2.60	2.88	2.52

Extract from Run No. II was incorporated in white oil to the extent of 3%. This increased the time required for 100 g. to absorb 1800 ml. of oxygen from less than 2 to 236 hours. Corresponding extracts obtained at higher (e. g. reflux) temperatures were considerably less effective.

It has been found that when this mercuric acetate extraction of the oil is carried out at room temperature or lower (i. e. below about 20° C. and preferably near the melting point of acetic acid) the content of desirable sulfur constituents in the extract is greater than if the oil is refluxed or maintained at a higher temperature while treating with the mercury salt. In general, any mercury salt, particularly the mercuric salts soluble in acetic acid such as the oxalate, carbonate, chloride, sulfate, etc. or their mixtures, may be employed in like manner as the mercuric acetate, since these salts will give mercuric acetate in the acetic acid solution. The solubility of the acetate is considerably greater than for the other salts, hence it is generally more advantageous to start with the mercuric acetate. As compared with salts of other metals, the mercury salts are definitely superior for this purpose as shown by the foregoing data.

The herein described compositions possessing the required amount of available or reactive sulfur may also be incorporated advantageously in extreme pressure lubricants, cutting oils, roll oils, wire drawing lubricants, greases, hypoid gear lubricants, etc. They may also be used to impart anti-wear and/or anti-oxidant properties to lubricants not necessarily subject to high pressure, such as turbine oil, refrigerator oil, lubricants for bearings, in particular, modern alloy bearings comprising cadmium-silver, cadmium-nickel, copper-lead, "high lead" alloys, as well as Babbitt metal, and the like. The lubricating media also need not be derived in whole or in part from mineral oil but may consist in whole or part of vegetable or animal lubricants such as palm oil, cottonseed oil, fish oil, animal wax, phosphatides, etc., as well as the so-called synthetic lubricants (e. g. polymers of olefins derived from cracked wax). In addition, by reason of their anti-oxidant properties, such additives may be incorporated advantageously in organic substances not intended for use as lubricants at all, such as gasoline, kerosene, spray oil, medicinal oil, transformer or electrical insulating oil, cleaning fluid, synthetic or natural rubber, Diesel fuel, photographic developers, etc.

Particular reference may be made to the inclusion of the herein described anti-oxidants as additives for coating materials such as asphalt, resins, oils, waxes, varnish, insulating or moisture-protective substances such as oiled or "waxed" paper, etc. Such plastic or semi-plastic vehicles may also contain, for example, anti-rusting agents and be applied to metal surfaces to provide a corrosion-resistant coating. Also such oxidation inhibited adhesive coatings may be applied to wood, paper, cardboard, felt, stone, laminated glass, fabric, concrete, plastic compositions, Transite board, etc., by such methods as roller coating, dipping, brushing, spraying and the like.

When the sulfur compounds of this invention are intended for addition to lubricating oils, they or the concentrates which contain them should have boiling temperatures above gas oil range and preferably within or above lubricating oil range.

These compounds may also be advantageously

used in connection with other additives in lubricating media, for example, detergents formed from the oil-soluble salts of various bases with detergent forming acids. Such bases include metallic as well as organic bases. Metallic bases include those of the alkali metals, as well as Cu, Mg, Ca, Sr, Ba, Zn, Cd, Al, Sn, Pb, Cr, Mn, Fe, Ni, Co, etc. Organic bases include various nitrogen bases as primary, secondary, tertiary and quaternary amines.

Examples of detergent forming acids are the various fatty acids of, say, 10 to 30 carbon atoms, wool fat acids, paraffin wax acids (produced by oxidation of paraffin wax), chlorinated fatty acids, aromatic carboxylic acids including aryl fatty acids, aryl hydroxy fatty acids, paraffin wax benzoic acids, various alkyl salicylic acids, phthalic acid mono esters, aromatic keto acids, aromatic ether acids; diphenols as di-(alkyl phenol) sulfides and disulfides, methylene bis alkylphenols; sulfonic acids such as may be produced by treatment of alkyl aromatic hydrocarbons or high boiling petroleum oils with sulfuric acid; sulfuric acid mono esters; phosphoric acid mono and di-esters, including the corresponding thiophosphoric acids; phosphonic and arsonic acids, etc.

Non-metallic detergents include compounds such as the phosphatides (e. g. lecithin), certain fatty oils as rapeseed oils, voltolized fatty or mineral oils.

Other detergents are the alkali earth phosphate di-esters, including the thiophosphate di-esters; the alkali earth diphenolates, specifically the calcium and barium salts of diphenol mono and poly sulfides; etc.

Our sulfur additives may also be used in association with other anti-oxidants, for example alkyl phenols such as 2,4,6-trimethylphenol, pentamethylphenol, 2,4-dimethyl-6-tertiary-butylphenol, 2,4-dimethyl-6-octylphenol, 2,6-di-tertiary-butyl-4-methylphenol, 2,4,6-tri-tertiary-butylphenol, etc.; amino phenols as benzyl amino phenols; amines such as dibutylphenylene-diamine, diphenylamine, phenyl-alpha-naphthylamine, phenyl-beta-naphthylamine, dinaphthyl amines; etc.

Other corrosion inhibitors may also be present such as dicarboxylic acids of 16 and more carbon atoms, alkali metal and alkali earth salts of sulfonic acids and fatty acids, etc.

Likewise, other additives may be present in a lubricating oil or grease such as blooming agents, anti-foaming agents, viscosity index improvers, etc.

Instead of first producing the herein described additive and then adding it to a lubricating oil, a high sulfur asphaltic crude such as raw Utanol may be added to a crude petroleum, for example a topped crude suitable for the manufacture of lubricants, and the mixture then subjected to one or several treatments adapted to remove substantially all asphaltenes and at least a portion of aromatic hydrocarbons such as previously described. Amounts of this high sulfur oil which may be added to the crude lubricating stock vary with the amount and availability of the sulfur content of the former, as explained before, and may range preferably from about 2% to 15%.

We claim as our invention:

1. A process for obtaining a sulfur-containing fraction possessing anti-oxidant and other valuable properties; which process comprises extracting a substantially paraffinic lubricating oil

raffinate with a mercury salt under temperature conditions to produce a mercury salt-sulfur compound complex and breaking the resulting mercury salt-sulfur compound complex to regenerate and recover the extracted sulfur compounds.

2. A process for obtaining a sulfur-containing fraction possessing antioxidant and other valuable properties, which process comprises extracting a substantially paraffinic lubricating oil raffinate with a mercury salt under conditions of atmosphere and temperature to substantially avoid any oxidation and to produce a mercury salt-sulfur compound complex, and breaking the resulting complex to regenerate and recover the extracted compounds.

3. A process for obtaining a sulfur-containing fraction possessing antioxidant and other valuable properties, which process comprises extracting a substantially paraffinic lubricating oil raffinate with a mercury salt at a temperature below about 20° C. and breaking the resulting sulfur complex to recover the extracted sulfur compounds.

4. A process for obtaining a sulfur-containing fraction possessing antioxidant and other valuable properties, which process comprises extracting a substantially paraffinic lubricating oil raffinate with glacial acetic acid saturated with mercuric acetate and breaking the resulting sulfur complex to recover the extracted sulfur compounds.

5. A process for obtaining a sulfur-containing fraction possessing antioxidant and other valuable properties, which process comprises extracting a substantially paraffinic lubricating oil raffinate with a mercury salt at a temperature not above about 50° C., thereby producing a mercury salt-sulfur compound complex, and breaking the resulting complex to regenerate and recover the extracted compounds.

6. A process for obtaining a composition possessing antioxidant and other valuable properties, which process comprises extracting a substantially paraffinic lubricating oil raffinate with a mercury salt at a temperature not above about 50° C., thereby producing a mercury salt addition compound, and breaking the resulting addition compound to regenerate and recover the extracted compounds.

7. A process for obtaining a composition possessing antioxidant and other valuable properties, which process comprises treating a substantially paraffinic lubricating oil raffinate with glacial acetic acid saturated with mercuric acetate, thereby producing a mercuric acetate addition compound, and breaking the resulting addition compound to regenerate and recover the extracted compounds.

8. An organic composition comprising a predominant amount of an organic substance which is unstable against oxidative deterioration and which is responsive to sulfur-containing antioxidants, and an added beneficiating amount of natural-occurring sulfur-containing compounds from petroleum oil possessing antioxidant and other valuable properties prepared by the process which comprises extracting a substantially

paraffinic lubricating oil raffinate with a mercury salt under temperature conditions to produce a mercury salt-sulfur compound complex and breaking the resulting mercury salt-sulfur compound complex to regenerate and recover therefrom the extracted compounds.

9. An organic composition comprising a predominant amount of a mixture of hydrocarbons, which mixture is unstable against oxidative deterioration and which is responsive to sulfur-containing antioxidants, and an added antioxidant amount of a concentrate of natural-occurring sulfur-containing compounds from petroleum oil possessing antioxidant and other valuable properties prepared by the process which comprises extracting a substantially paraffinic lubricating oil raffinate with a mercury salt under temperature conditions to produce a mercury salt-sulfur compound complex and breaking the resulting complex to regenerate and recover the extracted compound.

10. An oleaginous composition comprising a predominant amount of an oleaginous material which is unstable against oxidative deterioration and which is responsive to sulfur-containing antioxidants, and an added antioxidant amount of a concentrate of natural-occurring sulfur-containing compounds from petroleum oil possessing antioxidant and other valuable properties prepared by the process which comprises extracting a substantially paraffinic lubricating oil raffinate with a mercury salt under temperature conditions to produce a mercury salt-sulfur compound complex and breaking the resulting complex to regenerate and recover the extracted compound.

11. A lubricant comprising a predominant amount of a refined mineral oil, a small added amount of a normally corrosive detergent, and an added small amount sufficient to render the resultant mixture substantially non-corrosive of a concentrate of natural-occurring sulfur-containing compounds from petroleum oil possessing antioxidant and other valuable properties prepared by the process which comprises extracting a substantially paraffinic lubricating oil raffinate with a mercury salt under temperature conditions to produce a mercury salt-sulfur compound complex and breaking the resulting complex to regenerate and recover the extracted compound.

12. A lubricant comprising a predominant amount of a refined mineral oil and characterized by a normal tendency to corrode metal bearing surfaces, and an added corrosion-inhibiting amount of a concentrate of natural-occurring sulfur-containing compounds from petroleum oil possessing anticorrosive and other valuable properties prepared by the process which comprises extracting a substantially paraffinic lubricating oil raffinate with a mercury salt under temperature conditions to produce a mercury salt-sulfur compound complex and breaking the resulting complex to regenerate and recover the extracted compound.

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March 29, 1955

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2,704,981

APPARATUS FOR LIFTING HEAVY OIL

Filed Nov. 30, 1953

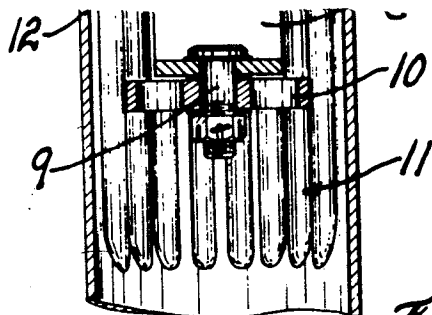
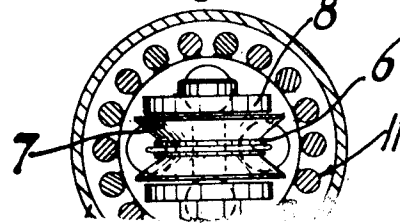
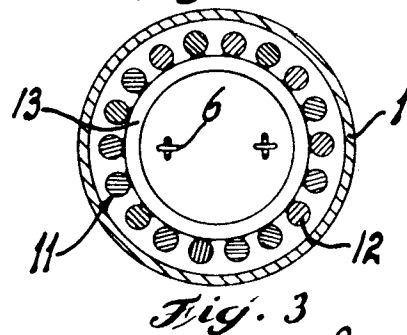
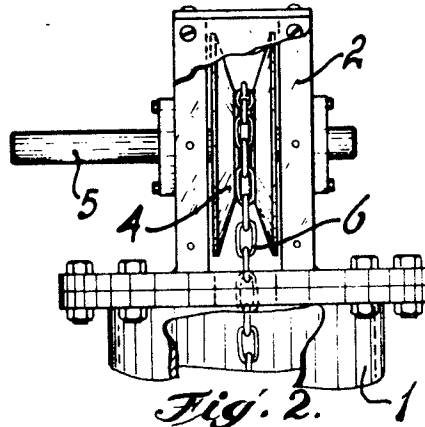
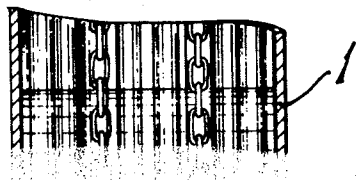
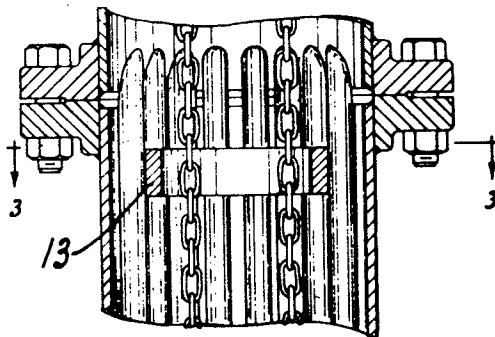
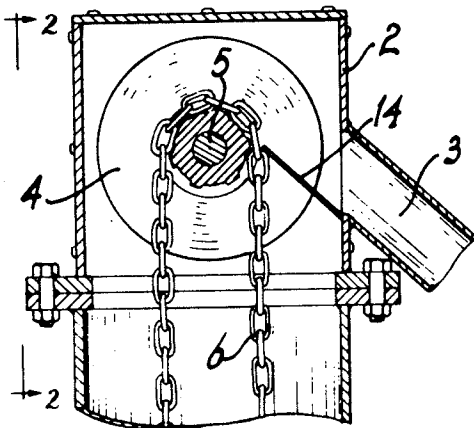


Fig. 1.

INVENTOR.  
GOTTFRIED L. GUSTAFSON

BY

*H. A. Duckman*  
ATTORNEY.

## Test on Well

Dear Sir:

Utanol Bases are characterized by their unusual content of non-corrosive sulphur - 12.5 %. The sulphur content by functional group is as follows:

FOR:

Acid Proof Enamel  
 Acid Proof Mastic  
 Acid Resisting Coatings  
 Acid Resisting Varnish  
 Anti-Corrosive Paint  
 Asbestos Filler  
 Acoustical Blocks  
 Armature Windings  
 Asphalt-Leather Composition  
 Battery Boxes  
 Built-Up Roofs  
 Caulking Compounds  
 Fungicides  
 Glazing Concrete  
 Horticulture Mulching Paper  
 Insulating Paper  
 Insulating Tape  
 Impregnating Material  
 Lubricants  
 Molding Compositions  
 Paint  
 Pipe Wrappings  
 Pipe Line Coatings  
 Plastics  
 Rubber  
 Shoe Filler  
 Sulphur Blowing-Substitute  
 Tree Surgery Compounds  
 Varnish  
 Waterproofing  
 Wire Rope Lubrication

Mercaptans --- 8 %

Sulfides --- 38 %

Thiophenes --- 54 %

Average specifications of Utanol are:

A. P. I. Gravity	---	9.4
Softening Point R & B	---	73 deg. F.
Resins	---	32.4 %
Asphaltenes	---	51 %
Distillation, atmospheric	---	17.3 % @ 492 deg. F.
	---	37.6 % @ 662 deg. F.

In requesting material for examination, please specify Rafinate (light portion) or Residue (heavy asphaltic portion) or both.

Hoping to be of service to you, we remain,

Sincerely,

Lee Scott

Lee Scott  
Marketing

LS/rr

July 20, 1964

MEMO FOR FILING:

Re: Charles E. King  
Well No. Rozel State #1  
Sec. 8, T. 8 N., R. 7 W.,  
Box Elder County, Utah

On July 17, 1964, I visited the above well site. The operator has completed drilling, but there were no personnel on the location to inquire of the status of the well.

The newly patented "chain-driven scraper" pump unit has been installed. It was reported that the company is waiting for fill-up to test for results.

PAUL W. BURCHELL  
CHIEF PETROLEUM ENGINEER

PWB:bc

cc: H. L. Coonts, Pet. Eng.  
Box 266  
Moab, Utah

June 26, 1964

Charles E. King  
P. O. Box 535  
Wichita Falls, Texas

Re: Notice of Intention to Drill Well No.  
ROZEL STATE #1, 1000' FSL & 800' FEL,  
NW SE SE of Section 8, T. 8 N., R. 7  
W., SLEM, Box Elder County, Utah.

Dear Sir:

Insofar as this office is concerned, approval to drill said well is hereby granted. However, this approval is conditional upon a bond being filed with the State Land Board, a surveyor's plat and Designation of Agent being filed with this office on/or before July 3, 1964.

As soon as you have determined that it will be necessary to plug and abandon the above mentioned well, you are hereby requested to immediately notify the following:

PAUL W. BURCHELL, Chief Petroleum Engineer  
Office: DA 8-5771 or DA 8-5772  
Home: CR 7-2890 - Salt Lake City, Utah

This approval terminates within 90 days if this well has not been spudded within said period.

Enclosed please find Form OGCC-8-X, which is to be completed if water sands (aquifers) are encountered while drilling, particularly assessable near surface water sands. Your cooperation with respect to completing this form will be greatly appreciated.

Please have the enclosed "Minimum Safety Requirements" notice posted in a conspicuous place on the drilling location.

Very truly yours,

OIL & GAS CONSERVATION COMMISSION

CLEON B. FEIGHT  
EXECUTIVE DIRECTOR

CBF:kgw

cc: Donald G. Prince, State Land Board, Salt Lake City, Utah

H. L. Coonts, Pet. Eng., Oil & G's Conservation Commission, Moab, Utah

32



## STATE OF UTAH

## OIL &amp; GAS CONSERVATION COMMISSION

## APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

## 1a. TYPE OF WORK

DRILL ☒DEEPEN ☐PLUG BACK ☐

## b. TYPE OF WELL

OIL WELL ☒GAS WELL ☐

OTHER

SINGLE ZONE ☒MULTIPLE ZONE ☐

## 2. NAME OF OPERATOR

Charles E. King

## 3. ADDRESS OF OPERATOR

P.O. Box 535, Wichita Falls, Texas

## 4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.)\*

At surface

NW/4 SE/4 SE/4 Section 8, 800' west of east line

At proposed prod. zone

1000' north of south line

## 14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE\*

42 miles wouthwest of Brigham City, Utah

## 15. DISTANCE FROM PROPOSED\*

LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. ---

(Also to nearest drlg. line, if any)

## 18. DISTANCE FROM PROPOSED LOCATION\*

TO NEAREST WELL, DRILLING, COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT. ---

## 16. NO. OF ACRES IN LEASE

200 acres

## 19. PROPOSED DEPTH

250' ✓

## 17. NO. OF ACRES ASSIGNED TO THIS WELL

2 acres

## 20. ROTARY OR CABLE TOOLS

Rotary

## 21. ELEVATIONS (Show whether DF, RT, GR, etc.)

4202' ground level

## 22. APPROX. DATE WORK WILL START\*

June 25, 1964

## 23.

## PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
16"	13-3/8 ✓	48 ✓	225'+ ✓	150 sacks ✓

The proposed location, within bounds of State Lease A2622, ML 3162, complies with Rule C-3 of the State of Utah Oil and Gas Conservation Act in that the well lies further than 660' from the nearest lease boundary. ✓ A topographic exception for this location is requested since the well is to be drilled along existing roadway constructed across the mud flats surrounding the shoreline at Rozel Point. ✓

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen or plug back, give data on present productive zone and proposed new productive zone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. Give blowout preventer program, if any.

## 24.

SIGNED

*David H. Jones*

TITLE

Petroleum Engineer

DATE

June 23, 1964

(This space for Federal or State office use)

PERMIT NO. \_\_\_\_\_

APPROVAL DATE \_\_\_\_\_

APPROVED BY \_\_\_\_\_

TITLE \_\_\_\_\_

DATE \_\_\_\_\_

CONDITIONS OF APPROVAL, IF ANY :